

Docket # 71267

HOOD WITH A DOUBLE WALL FOR A THERMOTHERAPY DEVICE

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of priority under 35 U.S.C. § 119 of German patent application DE 103 32 787 filed July 2, 2003 the entire contents of which are incorporated herein by reference.

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FIELD OF THE INVENTION

[0002] The present invention pertains to a hood with a double wall for a thermotherapy device.

BACKGROUND OF THE INVENTION

[0003] The problem usually occurring in thermotherapy devices for premature or

newborn infants with a hood, which is designed, e.g., as an incubator hood or as a hood of a hybrid, i.e., a combination of an open incubator and an incubator, is that part of the body heat of the premature or newborn infant is lost due to radiation to the cooler hood and, moreover, water of condensation is formed, which may drop off. To overcome this drawback, US 6,491,621 B1 describes an incubator in which the door or the lateral surfaces are provided with an inner double wall for receiving a hot air flow between the incubator and the inner double wall. The inner double wall can be folded away or removed. DE 36 16 359 A1 discloses an incubator that is designed as a double-walled cylindrical section, so that heated and humidified air can also be fed in here through the area between the two walls to form a heated air curtain.

[0004] The problem occurring in the known cases of hoods for incubators with a double wall is that moisture and microorganisms accumulate between the double wall and the hood. Moreover, the formation of water of condensation hinders the to of the premature or newborn infant in the interior of the thermotherapy device. Cleaning is therefore necessary at regular intervals, for which the hood must be opened and the double wall must be pivoted off or removed. This means additional work for the personnel, on the one hand, and, on the other hand, an adverse effect on the patient.

SUMMARY OF THE INVENTION

[0005] The object of the present invention is to provide a hood with a double wall with which the slightest possible adverse effect on the patient located therein is avoided.

[0006] The object is accomplished by the hood according to the present invention with a double wall.

[0007] In the hood according to the present invention with a double wall for a thermotherapy device, the double wall extends essentially in parallel to at least one limiting surface of the hood. This may be, e.g., the upper limiting surface. As an alternative or in addition the lateral surfaces or a flap located at the hood may be the location of the portion that combines to form the double wall. The double wall is arranged on the hood in such a way that it can be detached or pivoted off from the outside. No water of condensation will thus accumulate in the intermediate space between the double wall and the hood, and the intermediate space and interior surface is readily accessible from the outside, e.g., for cleaning purposes, without the patient, who may be a premature or newborn infant located in the thermotherapy device, being adversely affected.

[0008] In an advantageous embodiment, the double wall has a peripheral seal, which isolates a volume in the intermediate space, between the surfaces of the double wall portion and the hood surface, against the environment. Heat insulation is thus achieved, which leads to an increase in the temperature of the hood of the thermotherapy device, regardless of whether other heating means, e.g., a hot air flow, are provided.

[0009] The volume in the intermediate space, between the surfaces of the double wall portion and the hood surface, is advantageously filled with a material that possesses good

insulating properties. Air, i.e., regular ambient air, or a suitable insulating material, may be considered as preferable for use for this purpose.

[0010] The suitable insulating materials are, e.g., expanded materials with pores, in which air is enclosed, as well as materials that are also transparent.

5 **[0011]** In another preferred embodiment, the double wall is locked in a position at a predetermined distance at the hood. The distance is, e.g., between 6 mm and 15 mm and preferably between 10 mm and 11 mm in the narrowest area between the double wall portion surface and the hood surface. The locking structure or means for locking the double wall portion at the hood, is e.g., a pushing means, which extends through an elastic bush in the double wall
10 portion and widens the bush in its end position in the area of a hole in the hood. Such a pushing locking structure is used especially as a locking means against the displacement and falling out of the double wall portion during the opening of the hood of the thermotherapy device.

[0012] An exemplary embodiment of the hood according to the present invention will be explained on the basis of the drawings. The various features of novelty which characterize the
15 invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference is made to the accompanying drawings and descriptive matter in which a preferred embodiment of the invention is illustrated.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective top view in an oblique direction from the top toward a hood according to the present invention with a double wall;

Figure 2 is a top view at right angles from the top to the hood in Figure 1;

5 Figure 3 is a cross section along line A-B in Figure 2 showing an embodiment with air as the insulation; and

Figure 4 is a cross section along line A-B in Figure 2 showing an embodiment with a material and air as the insulation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

10 [0013] Referring to the drawings in particular, Figure 1 shows a perspective view of a hood 1 according to the present invention with a double wall portion (outer wall part or single to double wall adapter) 2 in an oblique direction from the top. The corresponding thermotherapy device is not shown. The thermotherapy device (or incubator) may use a bed surface and related features as described in 6,554,471, the disclosure of which is hereby incorporated by reference
15 and may use thermotherapy device features and control features as described in US Patent Nos. 6,653,605; 6,616,599; 6,554,471; 6,443,885; 6,409,653; 6,048,304; 5,944,651, the disclosure of each of these US patents is hereby incorporated by reference, and U.S. Patent Application Serial No. 09/850340 , the disclosure of which is hereby incorporated by reference.

[0014] The double wall portion 2 is fastened to the hood 1 by a pushing means as part of

a locking structure (means for locking) or connection means 5. Two positioning elements 6 are additionally used to position the double wall portion 2 at the hood 1.

[0015] The double wall 2 portion comprises a wall element 20 (e.g., formed of a transparent plastic) and a peripheral seal (e.g., formed of an elastomeric material) 3. Connecting the double wall portion 2 to the hood 1 (i.e., by locking structure or means for locking 5) results in the peripheral seal 3 engaging the hood 1 so that an intermediate space is enclosed by the double wall portion 2 and the hood 1 (see Fig. 3).

[0016] Figure 2 shows the hood 1 from Figure 1 at right angles from the top. The same reference numbers are used for identical components. The double wall portion 2 is disposed at the top of the hood 1.

[0017] Figure 3 shows a cross section through the hood 1 with a double wall portion 2, shown with the section taken along line A-B in Figure 2. The volume 4 enclosed in the intermediate space between the double wall portion or wall adapter 2 and the hood 1 can be recognized. In the embodiment of Figure 3, air is provided as the insulation in the volume 4 enclosed in the intermediate space between the double wall portion 2 and the hood 1.

Furthermore, an elastic bush 7 of the locking structure or means for locking 5 is shown. The elastic bush 7 accommodates the pushing means 50 of the locking structure or means for locking 5. The elastic bush 7 engages a receiving portion 6 of the hood 2. The receiving portion 6 may be provided in an opening in the hood with an annular receiving element 60 and an annular

sealing and connecting element (e.g., an elastomeric element) 63.

[0018] Figure 4 shows a view similar to Figure 3. Instead of air in the volume 4, the insulation in the embodiment of Figure 4 is an expanded material 40 with pores, in which air is enclosed. The material 40, is transparent.

5 **[0019]** In operation the double wall portion 2 is connected to the hood 1 via the locking structure or means for locking 5. The pushing means 50 of the locking structure or means for locking 5 is used to push the elastic bush 7 into the annular receiving element 60. With this connection and with a pushing action, the double wall portion 2 is connected to the hood 1 with the peripheral seal 3 engaging the hood 1 so that an intermediate space is enclosed by the double wall portion 2 and the hood 1 (see Fig. 3).

[0020] While specific embodiments of the invention have been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.